

NCP-19-7435



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Canada

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D412-664-203
Job Sheet 194647



Part No: D412-664-203

Job Qty: 1 pcs

Part Name: Aft Crosstube - High



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 5/7/19

Job Tracking No:

Due Date: 4/4/19

Created By: Shannon Hadley

Type: Stock

Description:

Note: D412-664-243 REV F/ IIN-D212-664 REV.J IPP Rev:E 04.02.16 Reformat; Added D3189-1 K/DS IPP Rev:F 06-03-29 Remove Comments on Pick List JLM IPP Rev:G 06.12.08 per ECN 886 EC IPP Rev:H 07-04-30 As per Rev D JLM IPP Rev:I 08-06-12 add comment in seq. 21 DD verified by:EC IPP rev J 11.04.21 DEO D412-664-243-E-1 EC verified DD IPP REV:K 11.10.03 DEO D412-664-243-E-2 DD verf:EC

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier	Lead Time	
110	Packaging 1 - Pick Kit	1 pcs	4/4/19		0.00	0.00	Packaging 1 - 1		
							Packaging 1 - 2		
							Packaging 1 - 3		
							Packaging 1 - 4		
							Packaging 1 - 5		
							Packaging 1 - 6		
							Packaging 1 - 7		
							Packaging 1 - 8		
							Packaging 1 - 9		
							Packaging 1 - 10		
							Packaging 1 - 11		
							Packaging 1 - 12		
							Packaging 1 - 13		
							Packaging 1 - 14		
							Packaging 1 - 15		
							Packaging 1 - 16		
							Packaging 1 - 17		
							Packaging 1 - 18		
							Packaging 1 - 19		
							Packaging 1 - 20		
							Packaging 1 - 21		
							Packaging 1 - 22		
							Packaging 1 - 23		
							Packaging 1 - 24		
							Packaging 1 - 25		
							Packaging 1 - 26		
							Packaging 1 - 27		
							Packaging 1 - 28		
							Packaging 1 - 29		

W/A
D412-664-203

					Packaging 1 - 30	
					Packaging 1 - 31	
					Packaging 1 - 32	
					Packaging 1 - 33	
					Packaging 1 - 34	
					Packaging 1 - 35	
					Packaging 1 - 36	
120	Crosstubes - Bend - 2 - B4B	1 pcs	4/4/19	0.00 5.26	Crosstubes - Bend - B4B	BS 06/28/2019
130	QC 15	1 pcs	4/4/19	0.00 0.00	QC 15 - 12	
					QC 15 - 3	
					QC 15 - 47	
					QC 15 - 49	
					QC 15 - 58	
					QC 15 - 9	DAS
					QC 15 - 68	19-06-28 68
140	Crosstubes - 2 - B4B	1 pcs	4/4/19	0.00 3.33	Crosstubes - 1 - B4B	9-89
					Crosstubes - 2 - B4B	BS 7/2/2019
					Crosstubes - 3 - B4B	
					Crosstubes - 4 - B4B	
160	Crosstubes - 3 - B4B	1 pcs	4/4/19	0.00 1.03	Crosstubes - 1 - B4B	
					Crosstubes - 2 - B4B	
					Crosstubes - 3 - B4B	GP 19-07-16
					Crosstubes - 4 - B4B	
165	QC 7	1 pcs	4/4/19	0.00 0.00	QC 7 - 10	
					QC 7 - 13	
					QC 7 - 14	
					QC 7 - 15	
					QC 7 - 17	
					QC 7 - 18	
					QC 7 - 19	
					QC 7 - 2	
					QC 7 - 28	
					QC 7 - 3	
					QC 7 - 30	
					QC 7 - 34	
					QC 7 - 36	
					QC 7 - 37	
					QC 7 - 41	
					QC 7 - 47	
					QC 7 - 48	
					QC 7 - 51	
					QC 7 - 58	
					QC 7 - 59	
					QC 7 - 60	
					QC 7 - 9	
					QC 7 - 68	
					QC 7 - 50	
					QC 7 - 67	DAS
					QC 7 - 40	JUL 17 2019 40
					QC 7 - 24	9-89
					QC 7 - 43	
170	QC 5	1 pcs	4/4/19	0.00 0.00	QC 5 - 10	
					QC 5 - 12	
					QC 5 - 17	
					QC 5 - 18	
					QC 5 - 19	
					QC 5 - 22	
					QC 5 - 24	
					QC 5 - 3	

					QC 5 - 43	
					QC 5 - 49	
					QC 5 - 51	
					QC 5 - 58	
					QC 5 - 68	
					QC 5 - 9	
					QC 5 - 50	
					QC 5 - 30	
					QC 5 - 40	
180	Outsource	1 pcs	4/4/19		SKY002-VC	5
190	Packaging 2-1 - Receive - B4B	1 pcs	4/4/19	0.00 0.00	Packaging 2 - 1 - B4B	
					Packaging 2 - 2 - B4B	
					Packaging 2 - 3 - B4B	
					Packaging 2 - 5 - B4B	
					Packaging 2 - 4 - B4B	
					Packaging 2 - 6 - B4B	
					Packaging 2 - 7 - B4B	
					Packaging 2 - 8 - B4B	
					Packaging 2 - 9 - B4B	
					Packaging 2 - 10 - B4B	
					Packaging 2 - 11 - B4B	
					Packaging 2 - 12 - B4B	
					Packaging 2 - 13 - B4B	
					Packaging 2 - 14 - B4B	
					Packaging 2 - 15 - B4B	
					Packaging 2 - 16 - B4B	
					Packaging 2 - 17 - B4B	
					Packaging 2 - 18 - B4B	
					Packaging 2 - 19 - B4B	
					Packaging 2 - 20 - B4B	
					Packaging 2 - 21 - B4B	
					Packaging 2 - 22 - B4B	
					Packaging 2 - 23 - B4B	
					Packaging 2 - 24 - B4B	
					Packaging 2 - 25 - B4B	
					Packaging 2 - 26 - B4B	
					Packaging 2 - 27 - B4B	
					Packaging 2 - 28 - B4B	
					Packaging 2 - 29 - B4B	
					Packaging 2 - 30 - B4B	
					Packaging 2 - 31 - B4B	
					Packaging 2 - 32 - B4B	
					Packaging 2 - 33 - B4B	
					Packaging 2 - 34 - B4B	
					Packaging 2 - 35 - B4B	
					Packaging 2 - 36 - B4B	
200	QC 5	1 pcs	4/4/19	0.00 0.00	QC 5 - 10	
					QC 5 - 12	
					QC 5 - 17	
					QC 5 - 18	
					QC 5 - 19	
					QC 5 - 22	
					QC 5 - 24	
					QC 5 - 3	
					QC 5 - 43	
					QC 5 - 49	
					QC 5 - 51	
					QC 5 - 58	
					QC 5 - 68	

DAS
40

JUL 17 2019 9-89
2019-07-19

JUL 19 2019

210 Spray Paint - 2 - B4B	1 pcs	4/4/19	0.00 1.47	QC 5 - 9	
				QC 5 - 50	
				QC 5 - 30	
				QC 5 - 40	
				Spray Paint - 1 - B4B	
				Spray Paint - 2 - B4B	
				Spray Paint - 3 - B4B	
				Spray Paint - 4 - B4B	
				Spray Paint - MJ1 - B4B	
				Spray Paint - MJ2 - B4B	
220 QC 14	1 pcs	4/4/19	0.00 0.00	Spray Paint - MJ3 - B4B	
				Spray Paint - MJ4 - B4B	
				QC 14 - 15	
				QC 14 - 2	
				QC 14 - 34	
				QC 14 - 41	
				QC 14 - 51	
				QC 14 - 58	
				QC 14 - 59	
				QC 14 - 9	
230 Crosstubes - 4 - B4B	1 pcs	4/4/19	0.00 3.33	QC 14 - 68	
				QC 14 - 40	
				QC 14 - 19	
				QC 14 - 43	
				QC 14 - 24	
				Crosstubes - 1 - B4B	
240 QC 5	1 pcs	4/4/19	0.00 0.00	Crosstubes - 2 - B4B	
				Crosstubes - 3 - B4B	
				Crosstubes - 4 - B4B	
				QC 5 - 10	
				QC 5 - 12	
				QC 5 - 17	
				QC 5 - 18	
				QC 5 - 19	
				QC 5 - 22	
				QC 5 - 24	
				QC 5 - 3	
				QC 5 - 43	
				QC 5 - 49	
				QC 5 - 51	
				QC 5 - 58	
				QC 5 - 68	
				QC 5 - 9	
				QC 5 - 50	
				QC 5 - 30	
250 Packaging 1-1 - Pick Kit - B4B	1 pcs	4/4/19	0.00 0.00	QC 5 - 40	
				Packaging 1 - 1 - B4B	
				Packaging 1 - 2 - B4B	
				Packaging 1 - 3 - B4B	
				Packaging 1 - 4 - B4B	
				Packaging 1 - 5 - B4B	
				Packaging 1 - 6 - B4B	
				Packaging 1 - 7 - B4B	
				Packaging 1 - 8 - B4B	
				Packaging 1 - 9 - B4B	
				Packaging 1 - 10 - B4B	
				Packaging 1 - 11 - B4B	
				Packaging 1 - 12 - B4B	
				Packaging 1 - 13 - B4B	

DAS
40
9-89

JUL 19 2019

RD 14-7-31

DAS
68
9-89

AUG 07 2019

RD 14-8-9

DAS
40
9-89

AUG 12 2019

				Packaging 1 - 14 - B4B	
				Packaging 1 - 15 - B4B	
				Packaging 1 - 16 - B4B	
				Packaging 1 - 17 - B4B	
				Packaging 1 - 18 - B4B	
				Packaging 1 - 19 - B4B	
				Packaging 1 - 20 - B4B	
				Packaging 1 - 21 - B4B	
				Packaging 1 - 22 - B4B	
				Packaging 1 - 23 - B4B	pc
				Packaging 1 - 24 - B4B	
				Packaging 1 - 25 - B4B	
				Packaging 1 - 26 - B4B	
				Packaging 1 - 27 - B4B	
				Packaging 1 - 28 - B4B	
				Packaging 1 - 29 - B4B	
				Packaging 1 - 30 - B4B	
				Packaging 1 - 31 - B4B	
				Packaging 1 - 32 - B4B	
				Packaging 1 - 33 - B4B	
				Packaging 1 - 34 - B4B	
				Packaging 1 - 35 - B4B	
				Packaging 1 - 36 - B4B	
260 QC 4	1 pcs	4/4/19	0.00 0.00	QC 4 - 28	
				QC 4 - 58	
				QC 4 - 69	
				QC 4 - 9	
				QC 4 - 46	
				QC 4 - 68	
270 Packaging 3-1 - Stock - B4B	1 pcs	4/4/19	0.00 0.00	Packaging 3 - 1 - B4B	
				Packaging 3 - 2 - B4B	
				Packaging 3 - 3 - B4B	
				Packaging 3 - 4 - B4B	
				Packaging 3 - 5 - B4B	
				Packaging 3 - 6 - B4B	
				Packaging 3 - 7 - B4B	
				Packaging 3 - 8 - B4B	
				Packaging 3 - 9 - B4B	
				Packaging 3 - 10 - B4B	
				Packaging 3 - 11 - B4B	
				Packaging 3 - 12 - B4B	
				Packaging 3 - 13 - B4B	
				Packaging 3 - 14 - B4B	
				Packaging 3 - 15 - B4B	
				Packaging 3 - 16 - B4B	
				Packaging 3 - 17 - B4B	
				Packaging 3 - 18 - B4B	
				Packaging 3 - 19 - B4B	
				Packaging 3 - 20 - B4B	
				Packaging 3 - 21 - B4B	
				Packaging 3 - 22 - B4B	
				Packaging 3 - 23 - B4B	
				Packaging 3 - 24 - B4B	
				Packaging 3 - 25 - B4B	WL
				Packaging 3 - 26 - B4B	
				Packaging 3 - 27 - B4B	
				Packaging 3 - 28 - B4B	
				Packaging 3 - 29 - B4B	
				Packaging 3 - 30 - B4B	

May B.

9/11/2019

				Packaging 3 - 31 - B4B	
				Packaging 3 - 32 - B4B	
				Packaging 3 - 33 - B4B	
				Packaging 3 - 34 - B4B	
				Packaging 3 - 35 - B4B	DAG
				Packaging 3 - 36 - B4B	21 SEP 11 2019
275 DC - 1 - B4B	1 pcs	4/4/19	0.00 0.00	DC - 1 - B4B	9-59
				DC - 2 - B4B	
280 QC 21 - FG	1 pcs	4/4/19	0.00 0.00	QC 21 - FG - 21	
				QC 21 - FG - 70	DAG
				QC 21 - FG - 53	21 SEP 11 2019

Part Op 110 - (Pick Kit)

Descriptions: 120 - CNC Alpha 160 Bender) Bend tube as per Dwg D412-664-243 using CNC bender program 412-aft and Folio FT010

130 - (QC15- Crosstube Dimensional Check)

140 - 1-Drill pilot holes in tube as per Dwg D412-664-243 using drill Jig DT8550 & DT8551 and drill table DT8577 using #9 holes as per QSI 10 to install towers. 2-Ream hole to finish size in tube as per Dwg D412-664-243 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes. 3-SCRIBE PART # & BATCH # ACCORDING TO NOTE 6

4- *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D412-664-243

160 - (Crosstubes Chemical Conversion) ***IMMEDIATELY AFTER GRINDING***

165 - (QC7-Inspect Chemical Conversion Coat)

170 - (QC5- Inspect part completeness to step on W/O) INSPECT ENGRAVING AND BATCH #

180 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

190 - (Receive & Inspect for Damage & Mat'l Certs) *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

200 - (QC5- Inspect part completeness to step on W/O) *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Inspect for damage & ensure results are as per Dwg D412-664-203

210 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** **VERIFY BY BATCH # TO MATCH W/O

PRIMER: 3154177 START TIME: 2-Paint outside crosstube with White Imron as per DWG D412-664-243 and QSI 005 4.2 3- Apply clear coat after paint as per DWG

220 - (QC14- Inspect Spray Paint) Then, Wrap in plastic bag to protect from scratches

230 - Assemble as per Dwg D412-664-203 1- Install center support using scoth-weld DP460 per QSI 015, as per DWG. note 13. Install supports clamps using as per Dwg D412-644-243. Install clamp with rubber cushion as per DWG. note 14. ***ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT*** Torque clamps on support to 80-100 IN-LBS AS PER DWG. EXP DATE: 20/8 3152072 **IF NOT ALREADY PRESENT ON CHAFFING SHIELD.** Apply a thin coat of proseal 890 per QSI 015 on inside concave surface of chaffing shield and let cure per manufacturer's instructions.

Install prosealed chaffing shield onto crosstube by applying a thin coat of proseal 890 onto crosstube. Be sure to eliminate any air gaps. Install and torque clamps on chaffing shield to 40-50 IN-LBS AS PER DWG. EXP DATE: 19/10 3194525

AFTER FINISH CURE TIME 24H START CURE TIME: 19-8-9 FINISH CURE TIME: 19-8-10

240 - (QC5- Inspect part completeness to step on W/O) ***RE-CHECK TORCQUE ON CLAMP AFTER PROSEAL HAS CURED FOR 24HOURS AS PER DWG.***

250 - (Pick Kit)

260 - (QC4- 100% Inspect kits for completeness)

270 - (Identify as per dwg & Stock Location:) Identify and pack for shipping as per PPP D412-664-203

*****Ensure tube is not packaged if curing time is less than 12 hrs, see step 27 for application time & date ***** Time & date of packaging: Location:

275 - Photocopy bluefile and create labels as per PPP D412-664-203 CHG 010

280 - (QC21- Final Inspection - Work Order Release) 1- *****LAY DOWN CORSTUBE ON TABLE AND PUT DT10302 PINS IN SADDLE HOLE FACING UP TO LOCATE CENTER OF CROSSTUBE***** Install center support using scoth-weld DP460 per QSI 015, as per DWG. note 13. Install supports clamps using as per Dwg D412-644-243. Install clamp with rubber cushion as per DWG. note 14. ***ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT*** Torque clamps on support to 80-100 IN-LBS AS PER DWG. 1- *****LAY DOWN CORSTUBE ON TABLE AND PUT DT10302 PINS IN SADDLE HOLE FACING UP, USE HOLE IN TAPE MESURE TO PUT IN PINS FOR LOCATING CENTER OF CROSSTUBE. ***** Install center support using scoth-weld DP460 per QSI 015, as per DWG. note 13. Install supports clamps using as per Dwg D412-644-243. Install clamp with rubber cushion as per DWG. note 14. ***ENSURE CLAMPS ARE ON TOP OF CROSSTUBE SUPPORT*** Torque clamps on support to 80-100 IN-LBS AS PER DWG.

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Job BOM

Part / Item	Component Name	Quantity	Operation	Container
D412-664-203TRN	Crosstube Turning Detail	1 pcs (1 ea)	110-Packaging 1 - Pick Kit	S186516
D2896-1	Support	1 pcs (1 ea)	230-Crosstubes - 4 - B4B	
D3189-1	Chaffing Shield	2 pcs (2 ea)	230-Crosstubes - 4 - B4B	
D3595-063-570	Rubber Cushion 0.63" Wide X 5.70" Long	2 pcs (2 ea)	230-Crosstubes - 4 - B4B	
MS21920-28	Clamp	4 Ea (4 ea)	230-Crosstubes - 4 - B4B	
MS21920-30	Clamp	2 Ea (2 ea)	230-Crosstubes - 4 - B4B	
AN6-40A	3/8-24 Bolt X 3" Long	4 Ea (4 ea)	250-Packaging 1-1 - Pick Kit - B4B	S133179
AN6-41A	Bolt	2 Ea (2 ea)	250-Packaging 1-1 - Pick Kit - B4B	S149318
MS21042L6	Nut	6 Ea (6 ea)	250-Packaging 1-1 - Pick Kit - B4B	S143697
NAS1149D0663J	Washer	18 Ea (18 ea)	250-Packaging 1-1 - Pick Kit - B4B	S167525

Job Allocations

Operation	Component Part	Required	Inventory	Allocated
110-Packaging 1 - Pick Kit	D412-664-203TRN	1	4	0
	D2896-1	① 9053883	19	0
	D3189-1	② 3175238	23	0
	D3595-063-570	② 5056072	103	0
	MS21920-28	④ 3171291	170	0
250-Packaging 1-1 - Pick Kit - B4B	MS21920-30	② 3162646	41	0
	AN6-40A	4	108	0
	AN6-41A	2	57	0
	MS21042L6	6	318	0
	NAS1149D0663J	18	1,212	0

Part Specifications

Specifications could not be found.

Item	Qty -243	Part Number	Description
1	X	D412-884-243	CROSSTUBE ASSEMBLY (412 HIGH AFT)
2	1	D8009-129	CROSSTUBE
3	2	D3595-083-570	RUBBER CUSHION
4	1	D2898-1	SUPPORT
5	2	D3189-1	CHAFING SHIELD
7	4	MS21920-28	CLAMP
8	2	MS21920-30	CLAMP (OR MS21920-32)
9	A/R	SCOTCH-WELD DP480	EPOXY ADHESIVE, 3M SCOTCH-WELD
10	A/R	PROSEAL 880 B-2	SEALANT

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D8009-129
FINISHED LENGTH = 124.100±0.020 (BEFORE BENDING)
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (ZN C8-2, HATCHED AREA)
PAINT OUTSIDE PER DART QSI 005 4.2
AFTER PAINTING, REMOVE MASKING AND APPLY MATTE CLEAR COAT
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED.
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: DART P/N "D412-884-243" AND B/N ON INSIDE OF CUFF PER QSI 044 8.4 (VIBRATING STYLUS)
- 7) WEIGHT: 47.0 lbs
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE. DO NOT GRIND TUBE AFTER SHOT PEEN.

TURNING

- 10) WHEN TRANSITIONING TO STOCK MAT'L, RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.

BENDING

- 11) BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 7% (BASED ON O.D.) IN LOWER HALF OF R30 BEND AND 8% (BASED ON O.D.) ON REMAINING TUBE.
- 12) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038. TO BE PERFORMED AFTER FINAL POST-BEND GRINDING. ANY ADDITIONAL GRINDING REQUIRES ANOTHER LPI INSPECTION.

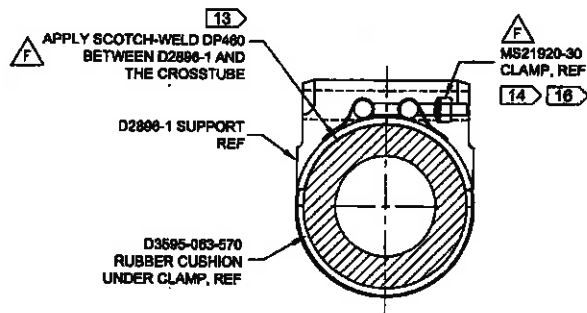
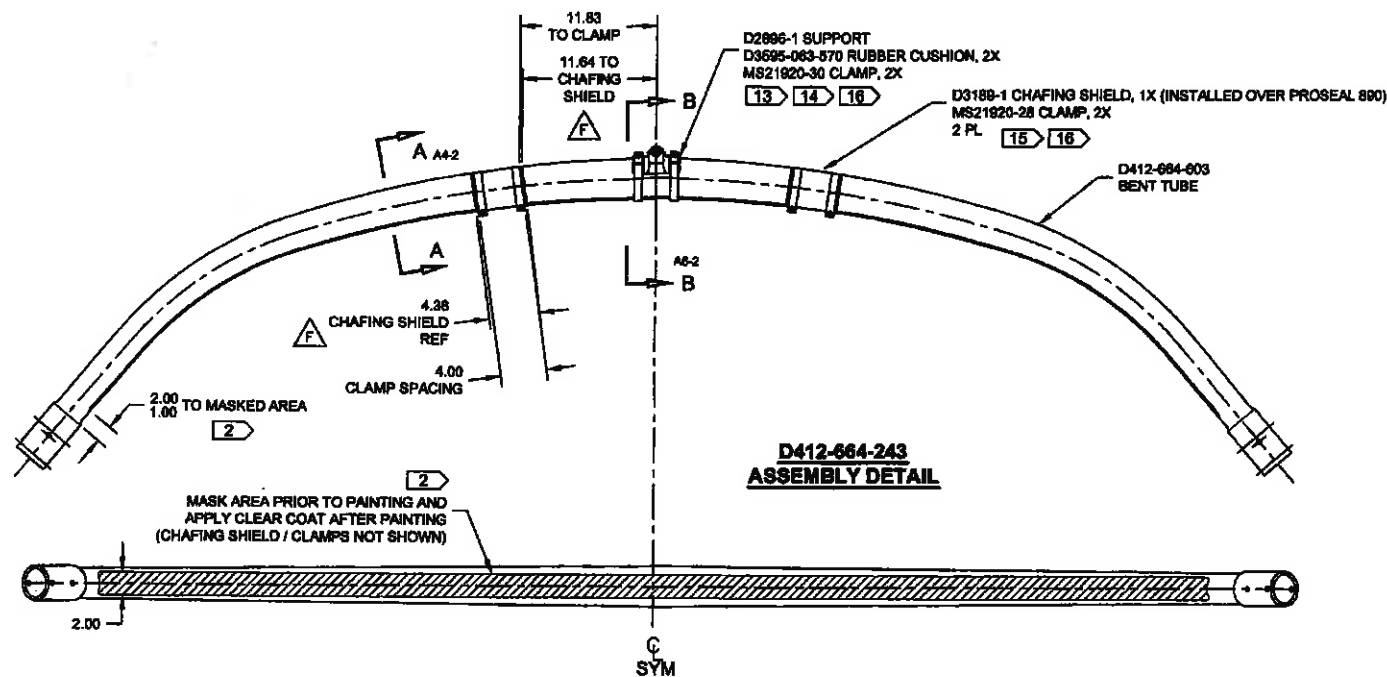
ASSEMBLY

- 13) INSTALL D2898-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD DP480 PER QSI 015.
- 14) INSTALL MS21920-30 CLAMPS (OR -32) WITH D3595-083-570 RUBBER CUSHIONS TO SECURE THE D2898-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE ON TOP SIDE OF CROSSTUBE.
- 15) APPLY A THIN COAT OF PROSEAL 880 ON INSIDE CONCAVE SURFACE OF D3189-1 CHAFING SHIELD AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL PROSEAL 880 ON INSIDE CONCAVE SURFACE OF D3189-1 CHAFING SHIELD BY APPLYING A THIN COAT OF PROSEAL 880 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- 16) TORQUE CLAMPS ON D2898-1 SUPPORT 80 TO 100 IN-LB. TORQUE CLAMPS ON D3189-1 CHAFING SHIELD 40 TO 60 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVES HAVE CURED FOR 24 HOURS.

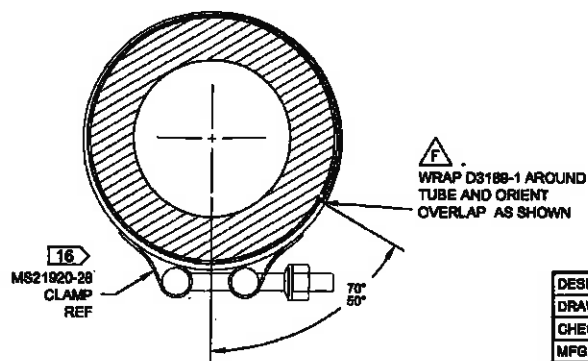
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SUBJECT TO A CHANGE
WITHOUT NOTICE
WORK ORDER
NO. 191400 MW

RELEASED
2014-05-26

F	NOTES RE-ORDERED, SCOTCH-WELD WAS MAGNOBOND (C8-1), ADD CLAMP RETORQUE (A8-1), REMOVE ABRASION STRIP, ADD INSPECTION WINDOW (C8-1), CHAFING SHIELD NOW 4.38 WIDE (C8-2), ADD 7% CRUSHING (B8-1), CHG BEND HEIGHT TOL. TO ±0.25 (C1-3), CHG CUFF TOL. (D2-4), CLAMPS FLIPPED TO PREVENT CHAFING (B7-2, B7-3), INCORP. DEO E-2/4	CP	14.04.01
E	REFORMAT/REVISE GENERAL NOTES; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; RELOCATED FLAG #6 PER PAR 08-048 (ZN A8-3); ADD TOLERANCE (ZN B8-3, C4-3, C8-3 & C5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	09.09.30
D	REMOVE D2732-058, CHANGE TO D3595-083-570	PH	07.03.08
C	REMOVE D2856-800-1087, ADD D2732-058 & MAGNOBOND 8386, MS21920-32 WAS MS21920-30	MB	06.10.27
B	ADD HOLES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	01.10.17
REV.	DESCRIPTION	BY	DATE
DESIGN			
DRAWN			
CHECKED			
MFG. APPR.			
APPROVED			
DE APPR.			
DATE	14.04.01		
DART AEROSPACE LTD HAWKESSBURY, ONTARIO, CANADA DRAWING NO. D412-884-243 REV. F SHEET 1 OF 4 TITLE CROSSTUBE ASSEMBLY (412 HI AFT) SCALE NTS COPYRIGHT © 2004 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT WAS ORIGINALLY PROVIDED WITHOUT THE WRITTEN PERMISSION OF DART AEROSPACE LTD.			



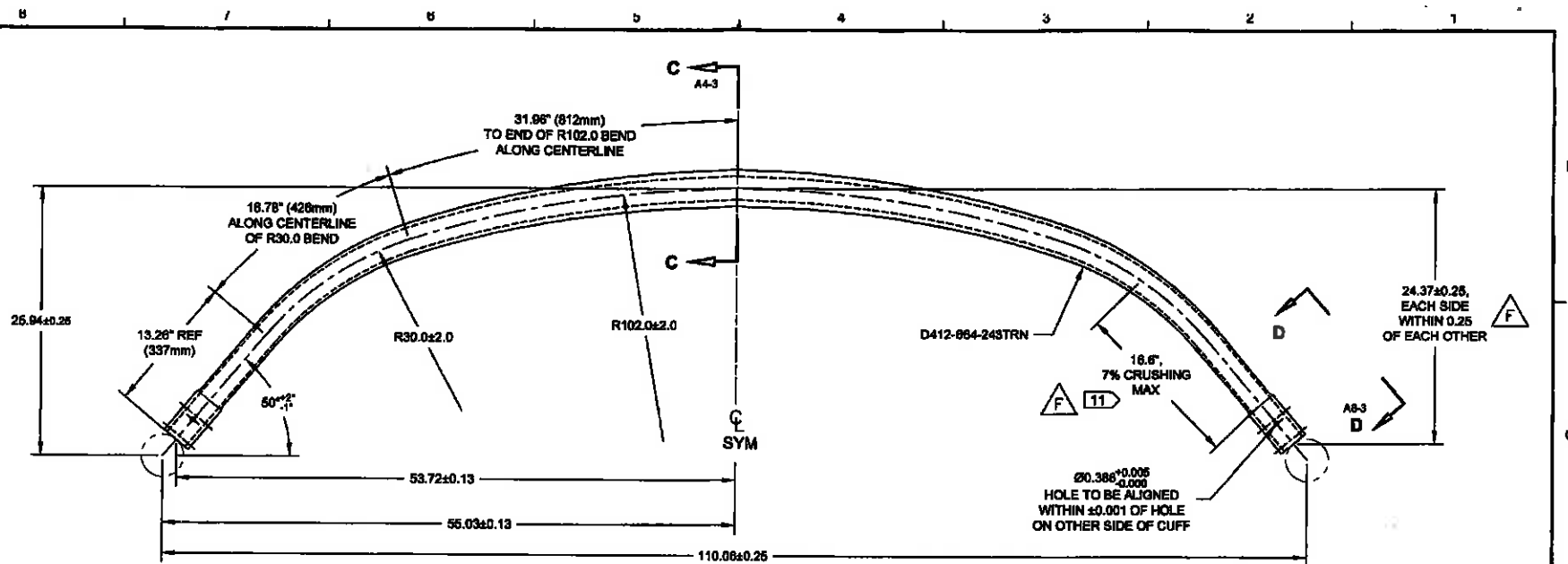
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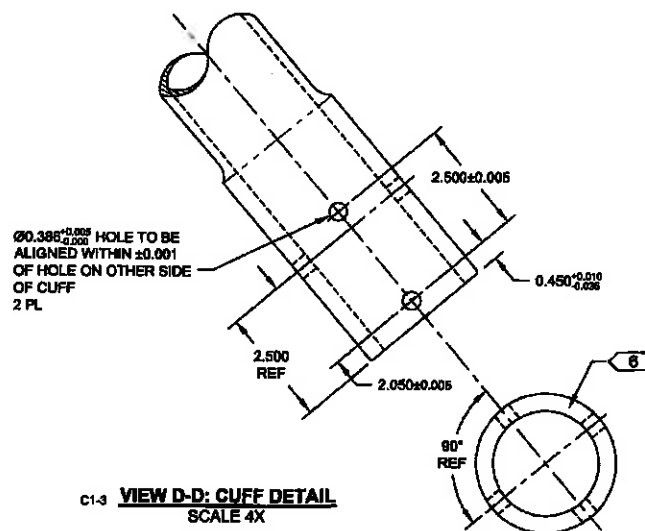
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RELEASED
2014-05-26
ND

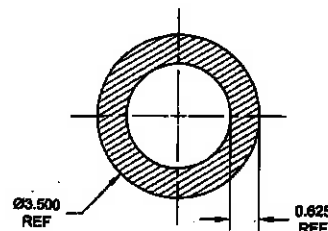
DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESSBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. F
MFG. APPR.		D412-664-243	SHEET 2 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
DATE	14.04.01	COPYRIGHT © 2001 BY DART AEROSPACE LTD	
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D412-864-803
BENDING AND DRILLING DETAIL



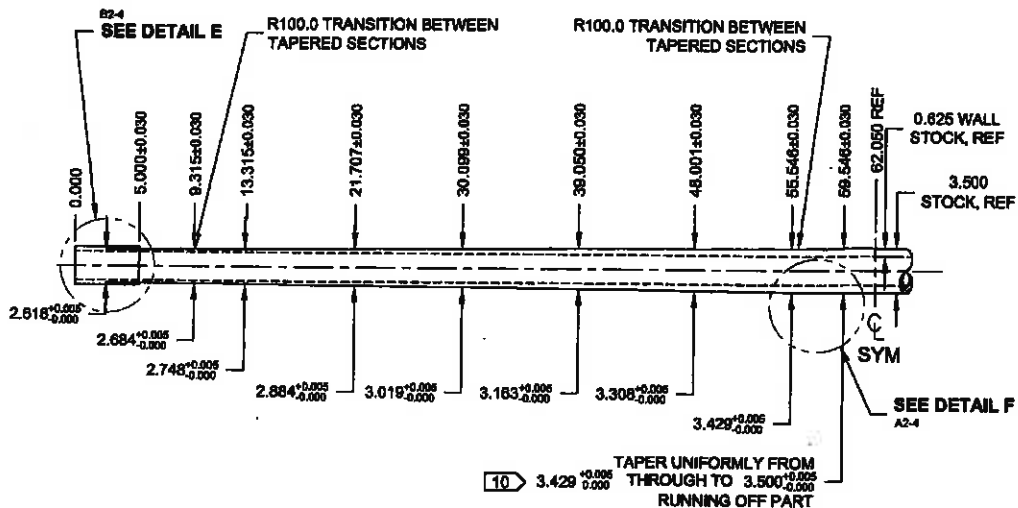
C1-3 **VIEW D-D: CUFF DETAIL**
SCALE 4X



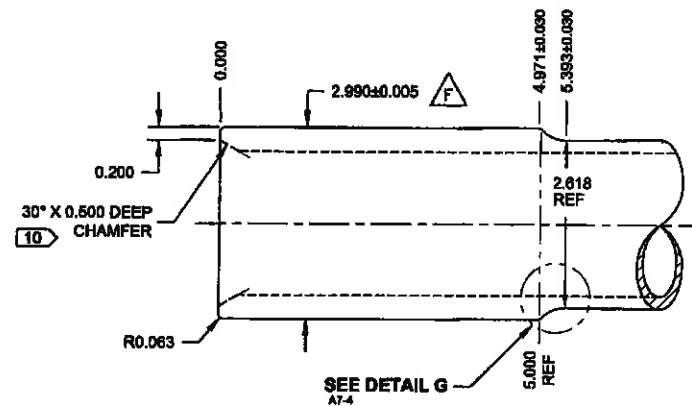
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RELEASED
2014-05-26

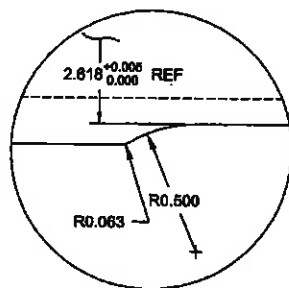
DESIGN	90	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	DW		
CHECKED		DRAWING NO.	REV. F
MFG. APPR.		D412-864-243	SHEET 3 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSSTUBE ASSEMBLY (412 HI AFT)	NTS
DATE	14.04.01	COPYRIGHT © 2001 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL. IT IS SUPPLIED ON THE UNDERSTANDING THAT IT IS NOT TO BE USED FOR ANY PURPOSES OR FOR ANY REPRODUCTION WITHOUT THE WRITTEN PERMISSION OF DART AEROSPACE LTD.	



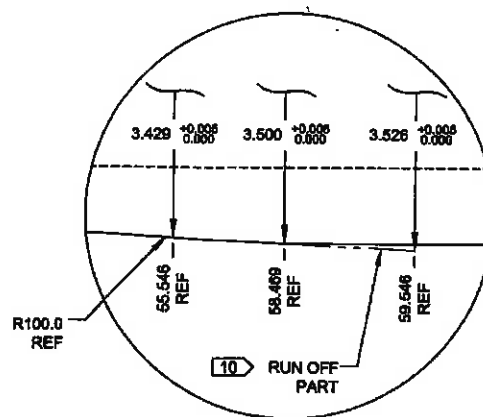
D412-664-243TRN
TURNING DETAIL



DETAIL E:
CROSTUBE CUFF
SCALE 5X



DETAIL G:
CUFF TRANSITION
SCALE 10X



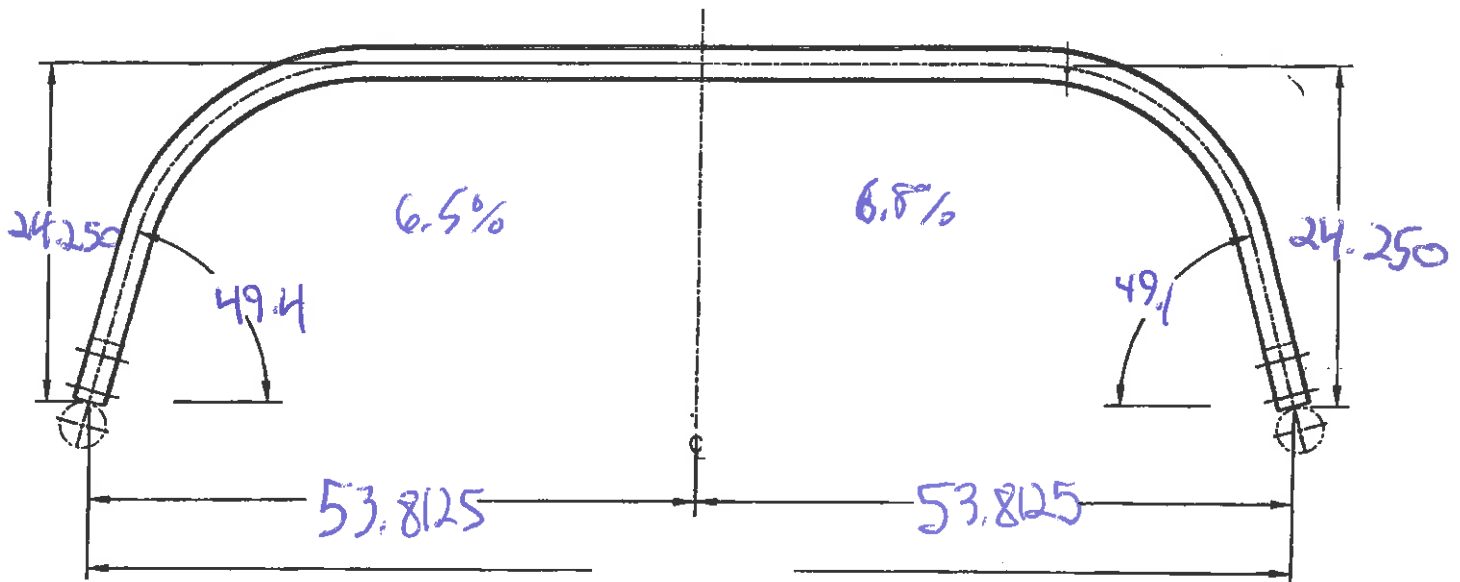
DETAIL F:
TAPER RUN-OFF
NOT TO SCALE

RELEASED
2014-05-26

DESIGN		DART AEROSPACE LTD	
DRAWN		HAWKESSBURY, ONTARIO, CANADA	
CHECKED		DRAWING NO.	REV. F
MFG. APPR.		D412-664-243	SHEET 4 OF 4
APPROVED		TITLE	SCALE
DE APPR.		CROSTUBE ASSEMBLY (412 HI AFT)	NTS
DATE	14.04.01	COPYRIGHT © 2001 BY DART AEROSPACE LTD	

DART AEROSPACE LTD	Work Order:	
Description: Crosstube High Aft (412)	Part Number:	D412-664-203
Inspection Dwg: D412-664-243 Rev: F		Page 1 of 1

Required Dimension	Min	Max
Height	24.12	24.62
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.70
Bending Passes	8	--
Crushing	--	7%



	Side A	Side B	
Bending Passes			2.605
Crushing	6.5%	6.8	2.985
Comments			
			.38

QC15 Inspection	DAS
Date	68
	JUN 26 2019

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.08	Dimensions updated per Dwg rev. D	KJ/JLM	
C	10.02.02	Dwg Rev updated	KJ	
D	12.04.16	Added bending, crushing dimensions	KJ	
E	14.09.08	Max crushing % revised	KJ	



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER POHB044044



Supplier: SKY002-VC
Skyservice
6120 Midfield Road
Mississauga
ON
L5P 1B1 Canada
Phone: 905-678-5636
Fax: 905-678-5841

Attention: Jenne, Heather

Ship To: 1270 Aberdeen Street
Hawkesbury
ON
K6A 1K7 Canada
Phone: 613-632-5200

PO No: POHB044044
PO Date: 7/18/19
Due Date: 7/19/19
**Purchase Order
Revision:**
Revision Date:
Ship-To Contact: Phone:

Via: Ground
Pymt Terms: Net 30
Freight Terms:
Special Comments:

Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
①	190568	D135-1027-253	Mid Height Aft Crosstube - DO NOT USE ISSUE P/O: _____ C OF C IS REQUIRED	Firmed	-	7/19/19	1 pcs	0 pcs	1 pcs	\$119.50/pcs	\$119.50
	190569		1 X JUL 19 2019	Firmed	-	7/19/19	1 pcs	0 pcs	1 pcs	\$119.50/pcs	\$119.50
Sub Total:							2	0	2		\$239.00
②	191905	D135-1027-251	Std Height Aft Crosstube - DO NOT USE ISSUE P/O: _____ C OF C IS REQUIRED	Firmed	-	7/19/19	1 pcs	0 pcs	1 pcs	\$119.50/pcs	\$119.50
	191907		1 X JUL 19 2019	Firmed	-	7/19/19	1 pcs	0 pcs	1 pcs	\$119.50/pcs	\$119.50
Sub Total:							2	0	2		\$239.00
③	190576	D135-1027-151	Std Height Fwd Crosstube - DO NOT USE ISSUE P/O: _____ C OF C IS REQUIRED	Firmed	-	7/19/19	1 pcs	0 pcs	1 pcs	\$119.50/pcs	\$119.50
	190575		1 X JUL 19 2019	Firmed	-	7/19/19	1 pcs	0 pcs	1 pcs	\$119.50/pcs	\$119.50
Sub Total:							2	0	2		\$239.00



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

PURCHASE ORDER

POHB044044



Items

Line Item	Job	Part	Description	Status	Account	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
4	194644	D412-664-203	Aft Crosstube - High : TC STC SH01-9 Issue 3, FAA STC SR01298NY 09/01/08, EASA STC EASA.IM.R.S.01304 07/03/06, DGAC MEXICO STC IA- 316/2015 15/06/17 *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***	Firmed	-	7/19/19	1 pcs	0 pcs	1 pcs	\$119.50/pcs	\$119.50
	194647		1 X JUL 19 2019	Firmed	-	7/19/19	1 pcs	0 pcs	1 pcs	\$119.50/pcs	\$119.50
	196270		1 X JUL 19 2019	Firmed	-	7/19/19	1 pcs	0 pcs	1 pcs	\$119.50/pcs	\$119.50
	196271		1 X JUL 19 2019	Firmed	-	7/19/19	1 pcs	0 pcs	1 pcs	\$119.50/pcs	\$119.50
Sub Total:							4	0	4		\$478.00

Grand Total: \$1,195.00

Order Notes

Procurement Quality Clauses
A005 right of entry
A012 chemical and physical test report
A016 personnel qualification
A017 raw material identification (as applicable)

A022 Apical Processing
A024 process certifications
A026 certification of material conformance

A041 quality management system
A042 dart notification by supplier
A043 retention of quality documents

A048 counterfeit parts avoidance, detection, mitigation and disposition program

A049 supplier awareness

Terms & Condition of Purchasing(Suppliers) and Procurement Quality Clauses are an integral part of our AS9100 requirements. To learn in detail, please visit www.dartaerospace.com for further explanation.

Plex 7/19/19 1:28 PM Dart.Guerin.Kimberley

**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

10105 Ryan Avenue, Dorval, Quebec, H9P 1A2

TCCA AMO 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO41122	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: POHB044044 ✓
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT ON:

- DAS
40
8-89
- ✓ 4 AFT CROSSTUBES , P/N: D412-664-203 , J/S: 194644 , 194647 , 196270 , 196271
 - ✓ 2 STD HEIGHT FWD CROSSTUBES , P/N: D135-1027-151 , J/S: 190575 , 190576
 - ✓ 2 STD HEIGHT AFT CROSSTUBES , P/N: D135-1027-251 , J/S# 191905 , 191907
 - ✓ 2 MID HEIGHT AFT CROSSTUBES , P/N: D135-1027-253 , J/S: 190568 , 190569

Action Taken:						Date:	Initial/Stamp:
LPI C/O IAW ASTM E-1417M-16						JUL 19 2019	 DOT-APP 20 53-89
NO CRACK FOUND							
PEN. ZL-56, MPO13600, CLEANER SKC-S MPO13923 , DEV. MPO11715 , UV LIGHT M-20142							
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

RECEIVED

JUL 19 2019

DART AEROSPACE LTD.

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature:	ACA/SCA Stamp DOT-APP 20 53-89	Date: JUL 19 2019
Name: RAMIN MELIKIAN		

5.0 PARTS LIST

5.1 HIGH GEAR CROSSTUBES

Item	QTY -101	QTY -201	QTY -203	Part Number	Description
	X			D212-664-101	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
		X		D212-664-201	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
			X	D412-664-203	CROSSTUBE INSTALLATION, 412 HIGH AFT
1	1			D212-664-141	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
2		1		D212-664-241	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
3			1	D412-664-243	CROSSTUBE ASSEMBLY, 412 HIGH AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21920-26)
13	4			AN6-35A	BOLT
14	4			AN6-36A	BOLT
15	6			MS21042L6	NUT (OR MS21042-6)
16	18			AN960JD616	WASHER
20		2		* D2940-1	SUPPORT
21		4		* D3595-063-530	RUBBER CUSHION
22		4		* MS21920-28	CLAMP (OR MS21920-30)
23		4		AN6-40A	BOLT
24		2		AN6-41A	BOLT
25		6		MS21042L6	NUT (OR MS21042-6)
26		18		AN960JD616	WASHER
30			1	* D2896-1	SUPPORT
32			2	* D3595-063-570	RUBBER CUSHION
33			4	* MS21920-28	CLAMP
34			2	* MS21920-30	CLAMP (OR MS21920-32)
35			4	AN6-40A	BOLT
36			2	AN6-41A	BOLT
37			6	MS21042L6	NUT (OR MS21042-6)
38			18	AN960JD616	WASHER
39			2	* D3189-1	CHAFING SHIELD
50	1	1		D3428-1	PLACARD

* REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-141/241 OR D412-664-243 ASSEMBLIES ABOVE.

NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AAI SKIDTUBES.

Change Record

PAGE 1 OF 1

Part Number: D412-664-203/-203AN/-203F

Description: CROSSTUBE INSTALLATION, HIGH AFT

[illegible]



Oct 21/19



NCR No.

19-743-

WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

Route update only

Job: <u>D412-664-203</u> Part No. <u>194647</u>		DISPOSITION Rework ☐ Scrap ☐ Use-as-is ☒		DEPARTMENT/PROCESS Skid-tube ☐ Machining ☐ Large Fab ☐ Cross tube ☐ Small Fab ☐ Finishing ☒ Eng. (Non-AW) ☐ Prod. Eng. Coord. ☐ Rec/Store/Packaging ☐ Engineering ☐ Water Jet ☐ Supplier ☐ Quality ☐			
Date :		Sequence #:		QTY Affected : <u>1</u>		MRB (QSI042)	
Description Work Order Deviation				Disposition			
Chafing shield dented/buckled				Acceptable to eng. Denting on bottom side with no sharp edge or discontinuity. use as is			
				Completed By <u>M.O. 19.08.16</u> Lead hand / Supervisor  <u>19-10-7</u>			
				QC / QA Coordinator <u>DAS</u> <u>68</u> <u>9-89</u> OCT 09 2019			
Root Cause		FAULT CATEGORY					
Operator ☒ Manufacturing Process ☒ Equip/Tooling ☐ Handling/Preservation ☐ Material ☐ Product Improvement ☐ Process Improvement ☐ Human Factors ☐		☐ Pressure/Forced ☐ Bending ☐ Crushing ☐ Cracks ☐ Crimp/Kink/Ripple/Wave/Twist ☐ Marks/Chatter ☐ Mislabeled ☐ Contamination ☐ Misaligned/off center ☐ BOM/Route ☐ Broken/Damage/Defect ☐ Incomplete/Unclear Instructions ☐ Drill Holes ☐ Fit/Function ☐ Power Loss/Surge ☐ Folio/Program ☐ Grain Direction ☐ Weld ☐ Wrong Stock Pulled ☐ Out of Sequence ☐ Off-set/Set-up ☐ Positioned Wrong ☐ Outside Tolerance ☐ Drawing ☒ Finish ☐ Part Lost/Missing ☐ Misread					
		Other/Details:					